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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,729	09/17/2003	Seetharaman Janakiraman	TI-36218	2219

23494 7590 07/14/2004

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EXAMINER
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LAUTURE, JOSEPH J

ART UNIT	PAPER NUMBER
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2819

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/663,729

Applicant(s)

JANAKIRAMAN ET AL.

Examiner

Joseph Lauture

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 8, 16-18, 22 and 23 is/are rejected.
- 7) ☒ Claim(s) 4, 6, 9-15, 19-21 and 24-30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### *Specification*

The application has not been checked to the extent necessary to determine the presence of all possible typographical and grammatical errors. Applicant's cooperation is requested in correcting any errors of which he/she may become aware in the application.

### *Drawing Objections*

The drawings are objected to under 37 CFR 1.83(a). Many of the claimed limitations are not shown. The drawings must show every feature of the invention specified in the claims. Therefore, the "means for generating a difference voltage" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as

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per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3,5 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bazarjani (US 6,538,588) in view of Hester et al (US 5,675,340).

Bazarjani teaches in figure (2) an apparatus and method of converting an analog input signal to accurate output signal codes of N bits each, the apparatus including: a combiner (42A) that receives an analog input signal; a quantizer (46a) that converts a sample of said analog input signal into an N-bit digital code; a subtractor (56A) that generates at a plurality of time points a difference voltage of said sample and a voltage level represented by said N-bit digital code; a quantizer (46B) that converts said difference at voltage at a corresponding plurality of time points into output codes; and a noise cancellation logic (90) that performs an addition operation based on an average of a plurality of output codes to determine an accurate output digital code, and corrects the output codes in a positive or negative direction.

Bazarjani teaches the essential features of the claimed invention as set forth above except for successive approximation register (SAR) circuit. However, Hester et al teach in figure (6) an analog-to-digital converter system that includes a SAR circuit (108) to calibrate the apparatus. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate this scheme of Hester et al into the system of Bazarjani to improve system performance and reliability because it would reduce threshold hysteresis and conversion errors (See column 5, lines 47-48). It would have been further obvious to adjust upward or down ward the bit-output of the converter system based on its target application, as some applications require a particular format. One such example is digital audio systems that generally require a one-bit format.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7, 8, 22 and 23 are rejected under 35 U.S.C 102(b) as being anticipated by Hester et al (US 5,675,340).

Hester et al teach in figure (6) a successive approximation (SAR) type analog-to-digital converter, the successive approximation circuit including: a comparator (112) that provides a comparison result of a first analog signal  $V_{in}$  and a processed sample of the same signal; a digital-to-analog converter DAC (110) that receives an intermediate N-bit

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value and an intermediate M-bit value, said DAC generating an analog signal; a successive approximation (SAR) logic that determines a first N-bit digital code (See figure 8) by sending said intermediate N-bit value in each of N iterations, and in each of M iterations, wherein the output of the SAR logic generates a plurality of bits that are added in an adder (120) to generate an average value, wherein the original code is corrected using this average value.

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Allowable Subject Matter

Claims 6,8-15, 19-21 and 24-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


### CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Lauture, whose telephone number is (571) 272-1805. The examiner can normally be reached Monday thru Friday between 9:30 am and 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached at (571) 272-1812. The fax number for the organization to which this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (571) 272-1562.

Joseph Lauture  
Group: 2819  
Date: 07/09/2004



Brian Young  
Primary Examiner